# Heuristic methods for the bus rescheduling problem

**Viktor Árgilán, János Balogh, Balázs Dávid, Miklós Krész**

Recovery from disruptions and the rescheduling of vehicles is a fairly new research field in the optimization of public transportation [1,2,3]. Vehicle disruptions can occur as a result of a variety of reasons: accidents, roadblocks, or simply because of the delay of one or more trips. Since disruptions happen on a daily basis, transportation companies have to consider a proper method to deal with this problem.

The typical way for companies to address the delay of one trip is by using a backup vehicle from the depot. However, the above approach might not always prove to be the most efficient solution, and dealing with several delayed trips simultaneously would require more backup vehicles present in the depot. Different modes of public transportation require various approaches for the solution of this problem. First, we give an overview of the models and methods in literature for the different types of vehicle rescheduling problems (aircraft, rolling stock, bus). Based on these methods, a mathematical model is developed for the multiple depot bus rescheduling problem.

However, certain aspects have to be considered when applying a solution method in practice. Most importantly, a practical situation needs a real time solution for the problem in order to guarantee efficiency in operations management. Fast heuristic approaches can be applied to give suggestions and help in supporting the decision itself. The two most important features of these methods are:

i) give a well-structured, realizable solution for the problem,

ii) solutions for the problem are expected to be produced in real time

To address the above requirements, we developed several types of solution algorithms for the problem which can help a transportation company in their decision support process.

## Acknowledgements

This work was supported by Gyula Juhász Faculty of Education, University of Szeged (project number CS-004/2012.V.3).

### References

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